

REMARKS

In the Office Action mailed 14 December 2006, the examiner rejected independent claims 1, 21, 41, 49, and 57 as obvious under §103 over Fitton (US2004/0028013) in view of Smee (US6990137). The applicants respectfully disagree and offer the following remarks in response. In addition, the applicants amend pages 7 and 9 of the specification as indicated in the attached Amendments to the Specification. The specification amendments provide the U.S. application serial number for the incorporated patent application. No new matter is added.

The claimed invention relates to the estimation of impairment correlation matrices for spread spectrum receivers. Independent claims 1, 21, 41, 49, and 57 each require estimating first and second impairment correlation matrices based on despread symbols received over multiple paths of a multi-path channel, and deriving a final impairment correlation matrix based on the first and second impairment correlation matrices. As shown in Figure 4 and claimed in independent claims 41 and 49, the receiver may suppress interference in the received signal by combining the despread symbols using weighting factors determined from the final impairment correlation matrix.

Fitton describes a spread spectrum wireless receiver that comprises interference suppression circuitry and a RAKE receiver having a plurality of RAKE fingers 514. The interference suppression circuitry estimates interference present in a received signal, respreads the interference estimate, and subtracts the interference estimate from the received signal to generate interference suppressed signals. Subsequently, each RAKE finger 514 in the RAKE receiver processes the interference suppressed signals according to conventional RAKE receiver means. See Figure 5 and ¶s [0088] – [0094].

In rejecting the independent claims, the examiner asserts that each RAKE finger 514 described in Fitton estimates a correlation matrix based on despread symbols received over multiple paths of a multi-path channel. Thus, the examiner asserts that the RAKE fingers 514 of

Fitton anticipate the claimed first and second correlation matrix estimators/estimation. The examiner further asserts that the combiner 528 of Figure 5 derives the claimed final correlation matrix. The examiner concedes that Fitton does not teach estimating an impairment correlation matrix. For this teaching, the examiner relies on Smee.

The examiner's assertions directly contradict the teachings of Fitton and the general understanding of RAKE receiver operations. Nothing in Fitton or in the knowledge of one skilled in the art teaches or suggests that multiple RAKE fingers derive different correlation matrices. Instead, each RAKE finger 514 in Fitton generates a sequence of despread symbols for one path of a multi-path channel by correlating a spreading code with a delayed and interference-suppressed version of the received signal (see ¶s [0083] – [0087] and Figure 4). Such despread symbols do not constitute correlation matrices. In fact, because each RAKE finger 514 in Fitton generates despread symbols for one path of a multi-path channel, one RAKE finger 514 necessarily cannot generate any type of correlation matrix or values based on despread symbols received over multiple paths of a multi-path channel.

Further, the combiner 528 in Fitton does not derive any type of matrix, much less the claimed correlation matrix. Instead, the combiner 528 sums the despread symbols output by each RAKE finger 514 to generate symbol estimates for the received signal.

Nothing in Fitton teaches or suggests determining any type of correlation matrix, much less the first and second impairment correlation matrices or the final impairment correlation matrix of independent claims 1, 21, 41, 49, and 57. Further, nothing in Smee corrects the deficiencies of Fitton. For at least this reason, the applicants respectfully request that the examiner reconsider and allow all pending claims.

Independent claims 41 and 49 and dependent claim 15 further claim combining the despread symbols using weighting factors determined from the final impairment correlation matrix to suppress interference. The applicants note that the pending rejections against

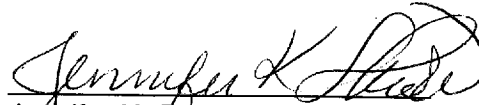
independent claims 41 and 49 do not address these limitations. As such, the rejection cited against claims 41 and 49 is incomplete and must be withdrawn.

Further, in rejecting dependent claim 15 the examiner asserts that element 528 of Figure 5 in Fitton shows combining despread symbols using the claimed weighting factors to suppress interference. First, while element 528 sums the despread symbols output by the RAKE fingers 514, nothing in Fitton teaches or suggests generating weighting factors determined from the claimed final impairment correlation matrix, or using any type of weighting factors as part of the combining process implemented by combiner 528 to suppress interference. In fact, Fitton specifically teaches suppressing interference from the received signal before processing the received signal with the RAKE fingers 514 and combiner 528 (see ¶s [0083] – [0094] and Figure 5). As such, the rejections cited against dependent claim 15 and independent claims 41 and 49 fail for this reason as well.

In light of the above remarks, the applicants request that the examiner reconsider the rejections cited against pending claims 1 – 60. Should any issues remain, the applicants request that the examiner call the undersigned so that any such issues may be resolved.

Respectfully submitted,

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